Research Paper: The Mediating Role of Rumination on Parenting Style, Childhood Trauma, and Adulthood Depression

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ABSTRACT

Objective: The present study aimed to determine the roles of maternal care and overprotection. We also explored how they are combined to develop rumination as well as various childhood traumas and parenting styles as the risk factors for depression.

Methods: This was a retrospective study with a causal-comparative design. In total, 175 students with the Mean±SD age of 21±2.75 years (age range: 18-35 years) affiliated to Alborz Medical University, Tehran University, and Kharazmi University have been selected using purposive sampling method. They completed the 2nd version of Beck Depression Inventory, Ruminative Response Scale, Parental Bonding Instrument, and Childhood Trauma Questionnaire. The obtained data were analyzed by the Analysis of Variance (ANOVA), path analysis, mediation analysis, and correlation calculations, in SPSS and AMOS.

Results: The mediating role of rumination in respect of parenting styles ($P<0.02$) and depression ($P<0.001$) was statistically significant. Moreover, parenting styles and childhood traumas, and their interaction may lead to the development of rumination and depression ($P<0.001$). The pathways of the effects were different; limited maternal care plays an indirect role in this process. This indicates that it will lead to depression and rumination only if emotional abuse is experienced in childhood. However, overprotection can directly lead to these conditions.

Conclusion: Paying attention to parenting styles, childhood traumas, and their interaction to prevent rumination and depression is important. This is due to the identified direct and indirect effects of parenting behaviors.

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Highlights

- The mediating role of rumination between parenting styles and depression has been proven.
- Both parenting styles and childhood traumas lead to rumination and depression.
- Low mother's care plays an indirect role in this process.

Plain Language Summary

Depression is a psychological disorder with different symptoms such as rumination which is defined by recurrent passive thoughts. Many factors can lead to these kinds of ideas and depression. Rumination can be formed during childhood by the way parents treat their children and also by the traumatic events a child faces. In this study, we tried to investigate the relationships among these factors. The results indicate that all factors are related together. In other words, parental behaviors can lead to depression directly and indirectly. Overprotection plays a direct role in this process, but the effect of low maternal care is indirect. As a result, childhood period can be crucial and provide the background for depression development when all these factors interact. Parents' behaviors and their effects, which provoke emotional or cognitive reactions in children can lead to depression in their adulthood.

1. Introduction

Over the past two decades, rumination has been considered important in comprehending the development and persistence of depression (Krause et al., 2017). It is defined as a set of recurrent passive thoughts (Clark & Beck, 2018), and creates mechanisms, leading to depression (Michl, McLaughlin, Shepherd, & Nolen-Hoeksema, 2013). Although the relation of rumination and depression is well studied, little is known about the development of this structure (Schweizer, Olino, Dyson, Laptook, & Klein, 2017). Response styles theory of depression states that rumination, as a cognitive style, is formed during childhood. Studies have considered factors like parenting styles (Chow & Lo, 2017; Williams, Harfmann, Ingram, Hagan, & Kramer, 2015), and childhood traumas (Kim, Jin, Jung, Hahn, & Lee, 2017), as effective environmental phenomena, leading to the development of rumination.

Manfredi et al., (2011) argued overprotection is the only important factor predicting the development of rumination and worry. However, Williams et al., (2015) suggested maternal care levels significantly predict brooding, depression severity, and anxiety symptoms. Low maternal care and high overprotection are associated with the development of anxiety and depression through the mediating role of dysfunctional cognitions (Acharya & Relojo, 2017).

Childhood abuse or trauma is another developmental antecedent of rumination and depression that has received significant empirical and theoretical attention. Maltreated children often experience a lack of control over their lives. Therefore, it can be another risk factor for developing a ruminative response style (Kim et al., 2017). Numerous studies have supported the relationship between childhood maltreatment and adulthood depression, with most of them focusing on sexual, physical, and emotional maltreatment and abuse (O'Neill et al., 2018). Gibb et al., (2001) supported the mediating role of negative cognitive styles between childhood emotional maltreatment and depression episodes in late adolescence and early youth. Additionally, childhood emotional abuse, as a partial mediator between childhood emotional abuse and depression, is related to rumination (O'Mahen, Karl, Moberly, & Fedock, 2015).

Parenting styles and childhood traumas are related to rumination and depression (Chow & Lo, 2017; Kim et al., 2017); however, they have not been simultaneously studied to unfold the related details. Furthermore, it is not specified which trauma types (physical, sexual, emotional) (Spasojević & Alloy, 2002) have a greater effect on the formation of rumination. In addition, there are diverse results about the effects of overprotection and care in this regard (Manfredi et al., 2011; O'Mahen et al., 2015; Williams et al., 2015). Therefore, it is necessary to clarify the role of these factors in inducing rumination and the concurrence of childhood traumas and parenting styles. The discriminative feature of this study was investigating the concurrence of perceived parenting

styles and childhood traumas, as well as the influences of various traumas on such relationship. We have hypothesized that care and overprotection are associated with rumination (Manfredi et al., 2011; Williams et al., 2015); childhood trauma and its scales are related to rumination (Kim et al., 2017); and rumination plays a mediating role between parenting styles and depression symptoms (Gate et al., 2013).

2. Methods

This was a retrospective study with a causal-comparative design. The target population included the students of Kharazmi University of Tehran, Tehran University, and Alborz University of Medical Sciences in the first semester of 2017. The sample size was estimated as 195 by the offered formulas in multiple linear regression studies (Hsieh, Bloch, & Larsen, 1998). Using a purposive sampling method, the data of 205 subjects were collected from the faculties of technology, science, literature, and medicine. Due to incomplete response patterns, 30 subjects were excluded from the study. The final sample contained 175 students (42.3% males), aged 18-35 years (Mean±SD age: 21±2.75 years).

Two researchers repeatedly attended college classes and explained the research to the students. The volunteer participants responded to the inventories after a short interview, comprising inclusion (growing up by biological parents, no history of mental and physical illnesses) and exclusion (current self-reported depression) criteria. Informed consent was obtained from the subjects. All ethical rights have been considered. The subjects' educational level were as follows: BS: 88%., MA: 10.9%, MD and PhD: 1.1%. Moreover, 90.3% were single, and 87.4% of them were monolingual. Each subject answered 4 questionnaires. Alpha and power were respectively calculated as 0.05 and 0.90. A hypothetical model was assumed where rumination scales (brooding and reflection) played a mediating role between maternal factors (care and overprotection) and depression symptoms. It included 5 variables and 8 covariates.

The correlation coefficients between these variables obtained from the previous studies were as follows: -0.31, 0.26, 0.44, and 0.42, respectively between brooding and maternal care, maternal overprotection, depression symptoms, and reflection; -0.15, 0.16, and, 0.41 between reflection and maternal care, maternal overprotection, and depression symptoms, and 0.34 between maternal care and maternal overprotection (Treynor, Gonzalez, & Nolen-Hoeksema, 2003; Williams et al., 2015). The obtained data were analyzed by the Analysis of Variance (ANOVA), path analysis, mediation analysis, and correlation calculations in SPSS and AMOS.

Instruments

Beck Depression Inventory-II: BDI-II was developed by Beck, Steer, & Brown (1996). It consists of 21 items evaluating depression symptoms in 4 options, ranging from 0 to 3 (Beck et al., 1996). BDI's internal consistency estimates yielded a mean coefficient alpha of 0.86 for psychiatric patients and 0.81 for non-psychiatric subjects (Beck, Steer, & Carbin, 1988). The internal consistency (Cronbach's alpha coefficient) and test-retest reliability of its Persian version were reported equal to 0.87 and 0.74, respectively (Ghassemzadeh, Mojtabai, Karamghadiri, & Ebrahimkhani, 2005).

Ruminative Response Scale (RRS): It is a subset of the Nolen-Hoeksema and Morrow (1991) Response Styles self-reporting questionnaire with 22 items scored on a Likert-type scale (1 to 4). Its Cronbach's alpha and retest reliability coefficients were 0.9 and 0.67, respectively (Yook, Kim, Suh, & Lee, 2010). Its obtained Cronbach's alpha coefficient in the present study was calculated as 0.91. The internal consistency of brooding and reflection subscales of the Persian version of RRS were reported to be 0.79 and 0.69, respectively. Moreover, the Cronbach's alpha coefficient for these subscales were 0.77 and 0.68, respectively (Mohammadkhani, Purmand, & Hassanabadi, 2013).

Parental Bonding Instrument (PBI). It was developed by Parker, Tupling, & Brown (1979). It is a 25-item self-reporting scale measuring the parenting styles experienced by people in their first 16 years of life. Parents are judged on a 4-point scale, and two factors (care and overprotection) are examined for both parents. It has to be separately completed by mother and father. Parenting styles are dividing into 4 categories, as follows: high care-low protection or optimal parenting; high care-high protection or affectionate constraint; low care-low protection or neglectful parenting; and low care-high protection or affectionless control. The cutoff points of care and overprotection factors were obtained as 27 and 13.5, respectively.

The internal reliability coefficients of the 'care' and 'overprotection' dimensions were reported as 0.85 and 0.68, respectively (Parker et al., 1979). The factor structure and psychometric properties of the Persian version of PBI were also examined. The Cronbach's alpha coefficients were all high, ranging from 0.79 to 0.88 for the maternal and the paternal forms (Behzadi & Parker,

2015). Cronbach's alpha coefficient of maternal care and overprotection were 0.89 and 0.76, respectively in this study. Considering recent studies about parenting styles and rumination emphasizing on mother's behaviors (Gate et al., 2013; Psychogiou et al., 2017; Williams et al., 2015), in this study, PBI was only used for the mothers.

Childhood Trauma Questionnaire-Short Form (CTQ-SF). It has 5 clinical scales, including emotional abuse, physical abuse, sexual abuse, emotional neglect, physical neglect as well as a total score, indicating general maltreatment. The reliabilities of the various scales of CTQ have been reported to be 0.79 to 0.94 by test-retest and the Cronbach's alpha coefficient methods. CTQ-SF consists of 5 items per clinical scale, 3 denial assessment items, and a total of 28 phrases (Bernstein & Fink, 1998). The validity and reliability of CTQ-SF (Persian version) have been reported by prior research. The test-retest reliability coefficient of its Persian version was equal to 0.90, and the mean score of internal consistency reliability coefficients for the subscales have been reported as 0.79 (Garrusi & Nakhaee, 2009). The Cronbach's alphas coefficients obtained in the present study were as follows: total maltreatment: 0.91; emotional abuse: 0.87; physical abuse: 0.96; sexual abuse: 0.91; emotional neglect: 0.68, and physical neglect: 0.68.

3. Results

Descriptive statistics are demonstrated in Table 1. The correlations between different variables are presented in Table 2. One-way ANOVA results revealed a significant difference in the total rumination score among those with different parenting styles of their parents, ($F_{1.137}$=3.910, P<0.01). Furthermore, this difference was statistically significant for brooding subscale, ($F_{1.137}$=2.946, P<0.34), but not for reflection, ($F_{1.137}$=0.904, P<0.441). Bonferroni post-hoc test results suggested a significant difference between affectionless control and optimal parenting in the total rumination score, (P<0.006), and brooding (P<0.003).

To understand which of the rumination and parenting factors may have the mediating role, multiple regression analyses were conducted. First, we examined the mediating role of rumination's scales between overprotection and depression symptoms. Then, the mediating role of these scales was examined between care and depression symptoms. The mediation analyses results are listed in Table 3. These analyses were conducted using Bootstrapping method (MacKinnon, Lockwood, & Williams, 2004; Preacher & Hayes, 2004). Indirect effects, with 95% Cl, were investigated based on 5000 bootstrap

Table 1. descriptive statistics of study scales by gender

Measure	Mean±SD		
	Female	Male	Total
Beck depression inventory	10.39±7.33	11.64±7.64	10.91±7.46
Rumination-total	45.23±13.58	47.89±10.70	46.35±12.48
Rumination-brooding	10.97±4.41	11.26±3.14	11.09±3.91
Rumination-reflection	10.12± 3.45	10.81±3.43	10.41±3.45
Maternal care	26.76±7.46	25.96±6.25	26.42±6.9
Maternal overprotection	17.01±6.39	16.94±6.54	16.98±6.43
Childhood trauma-total	36.60±16.04	37.59±11.52	37.00±14.28
Emotional abuse	7.48±4.18	7.84±3.72	7.60±3.90
Physical abuse	6.40±4.24	6.65±3.44	6.50±3.90
Sexual abuse	6.17±3.46	5.86±1.73	6.00±2.80
Emotional neglect	8.36±4.22	9.20±3.93	8.90±4.70
Physical neglect	6.73±2.93	7.44±2.91	7.00±2.90

Table 2. Calculated correlations between used scales

Scale	BDI	RT	RB	RR	MC	MO	CTT	EA	PA	SA	EN	PN
BDI	1.00											
RT	0.70***	1.00										
RB	0.61***	0.86***	1.00									
RR	0.43***	0.75***	0.46***	1.00								
MC	-0.31***	-0.33***	-0.28***	-0.19**	1.00							
MO	0.23**	0.23**	0.30***	0.02	-0.35***	1.00						
CTT	0.41***	0.37***	0.36***	0.16*	-0.69***	0.34***	1.00					
EA	0.45***	0.37***	0.37***	0.16*	-0.65***	0.40***	0.87***	1.00				
PA	0.34***	0.32***	0.33***	0.12	-0.46***	0.34***	0.86***	0.75***	1.00			
SA	0.27***	0.27***	0.34***	0.08	-0.42***	0.18*	0.76***	0.59***	0.70***	1.00		
EN	0.35***	0.36***	0.31***	0.22**	-0.73***	0.27***	0.78***	0.69***	0.54***	0.40***	1.00	
PN	0.25***	0.19*	0.17*	0.07	-0.49***	0.09	0.76***	0.53***	0.53***	0.52***	0.51***	1.00

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* P<0.05; ** P<0.01; ***P<0.001

BDI: Beck Depression Inventory; RT: Rumination-Total; RB: Rumination-Brooding; RR: Rumination-Reflection; MC: Maternal Care; MO: Maternal Overprotection; CTT: Childhood Trauma-Total; EA: Emotional Abuse; PA: Physical Abuse; SA: Sexual Abuse; EN: Emotional Neglect; PN: Physical Neglect

samples (Preacher & Hayes, 2004). The significance of each mediation model is summarized in Table 4.

The final model describes how childhood traumas and parenting styles were combined to induce rumination and depression symptoms (Figure 1). This model was evaluated by the Chi-squared test, Comparative Fit Index (CFI), Normed Fit Index (NFI), Root Mean Square Error of Approximation (RMSEA) in SPSS and AMOS. Path coefficients were measured at 0.05 significant level. The chi-squared test result was not statistically significant, x(df=3, n=175)=0.335, P<0.953 ; thus, there was no difference between the suggested model and the gathered data, and the observed data were consistent with this model. Good fit indices are presented in Table 5, indicating the fitness of the model with the obtained data. All the path coefficients were statistically significant (P<0.05). This model demonstrates that both of the parenting scales (care and overprotection) affect the development of ruminative brooding.

Table 3. Results of mediation analyses

IV	MV	DV	Effect of IV on MV (a)	Effect of MV on DV (b)	Direct Effect MV		Indirect Effect (a*b)	Total
					Before Controlling (c)	After Controlling (ć)		
MO	RB	BDI	0.30***	0.59***	0.23**	0.06	0.20(0.33<CI<0.96)	0.26
MC	RB	BDI	-0.21***	0.48***	-0.31***	-0.14*	-0.18(-0.32<CI<-0.07)	-0.32
	RR		-0.19**	0.18**				

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*P<0.05, **P<0.01, ***P<0.001; Numbers indicate standardized β coefficients (5000 bootstrap samples, N=174); IV:Independent Variable; MV: Mediating Variable; DV: Dependent Variable; CI:Confidence Interval

Table 4. Summary of mediating models

Model	1	2
R^2 Adjusted	0.36	0.40
F	50.00	0.40
Degrees of freedom	172.00	171.00
Between-group error	2.00	3.00
P	0.0001	0.0001

Table 5. Fitness indices of the model

Index	P
$x_{3.175}$	0.335
CFI	1.000
NFI	0.999
RMSEA	0.000

Moreover, the effect of care factor is entirely indirect and mediated by emotional abuse; although the effect of overprotection is partially mediated by emotional abuse with a direct main effect. Brooding and emotional abuse are also the predictors of depression symptoms. The effect of emotional abuse is indirect through partial mediating of brooding; however, its main effect is direct (Figure 1).

4. Discussion

The present study aimed to clarify the roles of care and overprotection, their combination in the development of rumination, and the simultaneous concurrence of various childhood abuse types along with parenting styles, in the development of depression symptoms. Calculating the correlations suggested that parenting styles and

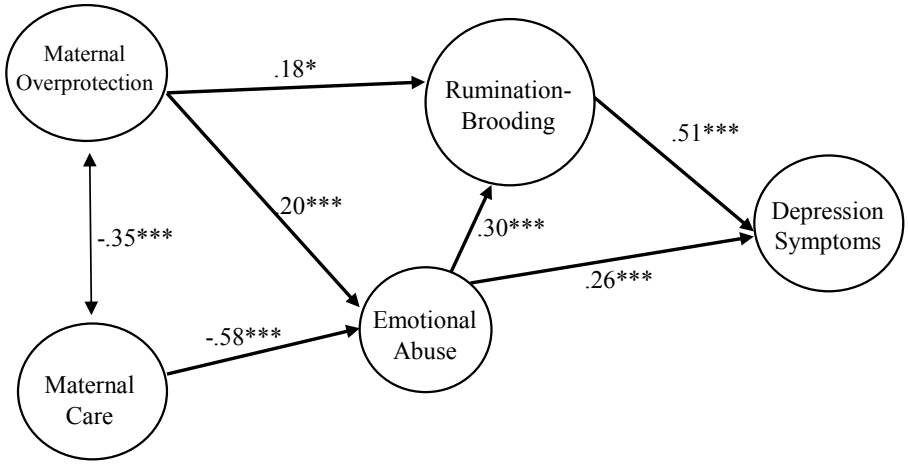

Figure 1. Structural equatmodel of overprotection, care factors, and ruminative brooding

Standardized path coefficients.

*P<0.05; **P<0.01; ***P<0.001

childhood traumas usually affect the development of ruminative brooding, more than reflection. Considering the definition of rumination components (Horwitz, Czyz, Berona, & King, 2018), brooding is more related to psychological distress and depression.

The difference in the severity of rumination between individuals who were grown up under optimal and affectionless control parenting styles was remarkable and only observed in the brooding scale. This finding is consistent with Johnson, Carr, and Whisman (2015) reporting overprotective parenting style and the negative-submissive expressivity of family during preschool predict rumination in youth. In addition, parenting styles correlated with high overprotection and control are associated with depression (Lay-Yee, Milne, Shackleton, Chang, & Davis, 2018).

By investigating the mediating variables, consistent with the results of Manfredi et al., (2011), we found brooding completely mediates between mother's overprotection and depression symptoms. Moreover, consistent with the results of Williams et al., (2015), the mediation of rumination components between mother's care and depression symptoms was determined; it is, directly and indirectly, contributed to the development of depression symptoms. Children whose caregivers are hostile and critical may fail to develop adaptive coping strategies (Gate et al., 2013; Schweizer et al., 2017).

Finally, we developed a model describing how parenting styles and childhood traumas combine to induce rumination and depression symptoms (Figure 1). Previous research studies have emphasized on the roles of overprotection (Manfredi et al., 2011), care (Williams et al., 2015), and their combination (McGinn, Cukor, & Sanderson, 2005) in the development of rumination. Our results supported the simultaneous effects of low care and high overprotection. The new finding is that limited mother's care indirectly induces rumination and depression through the development of emotional abuse; while, overprotection mainly and directly induces the rumination. Therefore, they differently contribute to the development of depression symptoms. Limited maternal care can only induce rumination and depression if it causes the perception of emotional abuse in the child. Thus, the role of child's temperament is very important (Schweizer et al., 2017). The direct effect of overprotection can be reflected in the destruction of child's chances of developing adaptive coping strategies, leading to high self-criticism, low self-efficacy, and passive strategies like rumination.

The main limitations of this study included applying the purposive sampling method, the small sample size, and the exclusive use of questionnaires, restricting the generalization of the obtained results. The present study emphasized on the role of environmental factors, including parent-child interactions, in the formation of dysfunctional coping strategies against psychological distresses. It can be beneficial in identifying vulnerable people to rumination and depression. The collected data suggested two potential parenting behaviors; those directly affecting the development of rumination (overprotective), and those interacting with child's temperament (caring). The obtained results reflect the importance of parental training. Interventions focusing on coping strategies and psychological trainings like problem-solving and active copings can be effective to reduce rumination. It is suggested that the temperamental variables be investigated in future studies to achieve a comprehensive model.

The obtained results suggested that low care and high overprotection significantly affect the development of rumination and depression. Moreover, limited maternal care indirectly influenced this process. This finding indicates that such condition may lead to depression and rumination, only if emotional abuse is experienced in childhood. However, overprotection mainly and directly can lead to these conditions. As a result, parenting styles, childhood traumas, and their interaction can be crucial in preventing rumination and depression.

Ethical Considerations

Compliance with ethical guidelines

All ethical principles were considered in this research. Informed consent was obtained from all study participants; they were also assured about the confidentiality of their information. Moreover, they were allowed to discontinue study participation as desired. Some of the obtained results are available to them upon request.

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Authors' contributions

All authors contributed in preparing this article.

Conflict of interest

The authors declare no conflict of interest.

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